

**Amendments to the claims:**

**This listing of claims will replace all prior versions, and listings, of claims in the application:**

**Listing of Claims:**

1. (currently amended) A system to measure a gas flow rate ~~[[for]]~~of a gas ~~provided~~  
~~by~~supplied from a mass flow controller to a process chamber via a process line,  
comprising:

- a. said mass flow controller;
- b. a vent line fluidly connecting to said process line between said mass flow controller and said process chamber, said vent line comprising
  - i. a bypass loop having an inlet junction and a return junction fluidly connecting said bypass loop to said vent line, and comprising
    - a. a flow detector ~~[[for]]~~ adapted to provide a measurement of ~~[[a]]~~ said gas flow rate as said gas, supplied from the mass flow controller, flows flowing through both said flow detector and said bypass loop;
    - b. a first bypass control valve between said inlet junction and said flow detector;
    - ii. a main vent line shut-off valve between said inlet junction and said return junction; and
  - c. a computational control device that receives data signals from said flow detector;

whereby said gas ~~flow directed~~while flowing through said bypass loop provides ~~[[a]]~~for said measurement of said mass flow controller's gas flow rate which provides information for quantitation or for calibration of said mass flow controller.

2. (currently amended) The system of claim 1, wherein said flow detector is a bypass mass flow controller.

3. (original) The system of claim 1, wherein said bypass loop additionally comprises a second bypass control valve between said flow detector and said return junction.
4. (original) The system of claim 1, additionally comprising a process line shut-off valve positioned between a junction between said vent line and said process chamber, wherein closing said process line shut-off valve directs all gas from said mass flow controller to said vent line.
5. (original) The system of claim 1, additionally comprising a manifold fluidly connecting two or more mass flow controllers to said vent line, whereby valving control of the manifold provides gas from any one of said two or more mass flow controllers to said vent line for said measurement.
6. (original) The system of claim 1, additionally comprising a process line shut-off valve positioned between a junction between said vent line and said process chamber, wherein closing said process line shut-off valve directs all gas from said mass flow controller to said vent line, and wherein said bypass loop additionally comprises a second bypass control valve between said flow detector and said return junction
7. (original) The system of claim 1, additionally comprising a back pressure or a back vacuum compensating system to provide a back pressure or a back vacuum to the flow detector in the bypass loop that is representative of the back pressure or back vacuum existing the said process chamber during use of said gas.
8. (currently amended) A system to measure a gas flow rate ~~[[for]]~~of a gas ~~provided~~  
~~by~~supplied from a mass flow controller to a process chamber via a process line,  
comprising:  
said mass flow controller;

a bypass loop fluidly connecting to said process line between said mass flow controller and said process chamber, said bypass loop comprising an inlet junction and a return junction fluidly connecting said bypass loop to said process line, and comprising a flow detector ~~[[for]]~~ adapted to provide a measurement of [[a]] said gas flow rate as said gas flows flowing through both said flow detector and said bypass loop;  
a first bypass control valve between said inlet junction and said flow detector;  
a process line shut-off valve between said inlet junction and said return junction; and  
a computational control device that receives data signals from said flow detector;  
whereby said gas flow ~~directed~~ while flowing through said bypass loop provides ~~[[a]]for~~ said measurement of said mass flow controller's gas flow rate which provides information for quantitation or for calibration of said mass flow controller.

9. (currently amended) The system of claim 8, wherein said flow detector is a bypass mass flow controller.

10. (original) The system of claim 8, wherein said bypass loop additionally comprises a second bypass control valve between said flow detector and said return junction.

11. (original) The system of claim 8, wherein said bypass loop additionally comprises a pressure release valve between said flow detector and said return junction.

12. (original) The system of claim 8, additionally comprising a first manifold fluidly connecting two or more process lines to said process chamber, whereby valving control of the manifold provides gas from any one of said two or more mass flow controllers to said bypass loop for said measurement.

13. (original) The system of claim 8, additionally comprising a second manifold fluidly connecting two or more process lines to said process chamber, whereby valving control of the manifold returns gas from said bypass loop to said process chamber.

14. (currently amended) A system to measure a gas flow rate for a gas provided ~~[[by]]~~ from a dedicated means for metering a gas to a process chamber via a process line, comprising:  
said dedicated means for metering;  
a line fluidly connecting to said process line between said dedicated means for metering and said process chamber, said line beginning at an inlet junction and comprising a first means to control ~~[[said]]~~ a gas flow flowing through said line, located between said inlet junction and a means for measuring; and  
said means for measuring ~~[[a]]~~ the gas flow flowing through said line, wherein said means for measuring is adapted to provide a measurement of said gas flow rate as said gas flows through both the means for measuring and the line;  
a means to direct gas through either the process line or the line fluidly connecting to said process line; and  
a computational control device that receives data signals from said means for measuring a gas flow; whereby said gas ~~flow directed~~ while flowing through said line fluidly connecting to said process line provides ~~[[a]]~~ for said measurement of said flow rate of said gas through said dedicated means for metering which provides information for quantitation or for calibration of said dedicated means for metering.

15. (currently amended) The system of claim 14, wherein said measurement is repeated over time and is used to quantify the gas flow rate passing through said dedicated means for metering.

16. (original) The system of claim 14, additionally comprising at least one additional dedicated means for metering at least one additional gas.

17. (original) The system of claim 16, wherein a comparison between set and measured flow rates of two or more of said dedicated means for metering, by said means for measuring a gas flow flowing through said line, provides a correction factor for said means for measuring a gas flow flowing through said line.

18. (currently amended) A method to calibrate a flow of gas to a process chamber that is set by a mass flow controller, comprising the steps of: setting the mass flow controller to a specific gas flow rate; adjusting valves to direct a calibrating gas flow from said mass flow controller through a vent line and into a bypass loop in fluid communication with said vent line by means of an inlet junction and a return junction, said bypass loop also comprising a flow detector [[for]] adapted to provide a measurement of said calibrating gas flow as said calibrating gas flow flows flowing through both said flow detector and said bypass loop; measuring a bypass loop gas flow rate of said calibrating gas flow with said flow detector; comparing said bypass loop gas flow rate to said desired gas flow rate; and calculating a relationship between said bypass loop gas flow rate and said desired gas flow rate whereby said relationship provides information to quantitate or to calibrate said mass flow controller, or to replace or to repair said mass flow controller.

19. (currently amended) A method to calibrate a flow of gas to a process chamber that is set by a mass flow controller, comprising the steps of: setting the mass flow controller to a specific gas flow rate; adjusting valves to direct a calibrating gas flow from said mass flow controller into a bypass loop in fluid communication with a process line by means of an inlet junction and a return junction, said bypass loop also comprising a flow detector [[for]] adapted to provide a measurement of said calibrating gas flow as said calibrating gas flow flows flowing through both said flow detector and said bypass loop; measuring a bypass loop gas flow rate of said calibrating gas flow with said flow detector; comparing said bypass loop gas flow rate to said desired gas flow rate; and calculating a relationship between said bypass loop gas flow rate and said desired gas flow rate wherein said process line is in fluid communication with said process chamber and with said mass flow controller, and whereby said relationship provides information to quantitate or to calibrate said mass flow controller, or to replace or to repair said mass flow controller.